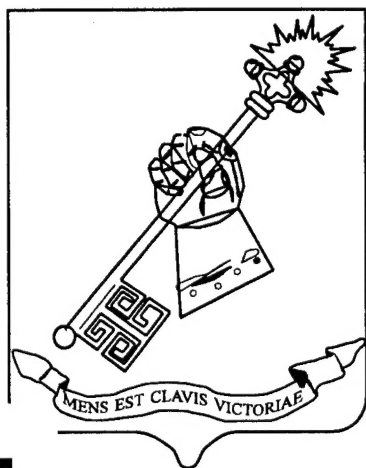


SHARING THE SORCERER'S AMULET: AN ALTERNATIVE TO DIVISION CHEMICAL STAFFS

A Monograph
By
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Chemical Corps



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Abstract

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This monograph argues that the current division chemical staff seems incapable of fulfilling its continuing, and increasingly important, role as the division commander's staff focal point for nuclear, biological and chemical (NBC) operations and weapons of mass destruction (WMD) effects. This monograph proposes an alternate model that integrates the missions, functions, and people of the division chemical staff throughout the division's coordinating staff. Using the division chemical staff as an illustration, this monograph demonstrates a model of change that provides integrative, synergistic effects for the commander and staff through innovative and low cost organizational evolution.

To support this thesis, this monograph develops three distinct criteria for assessing the current division chemical staff and the proposed alternative model. The first criteria focuses on the division chemical staff's ability to accomplish NBC defense doctrine - a linkage between organizational responsibilities and warfighting doctrine. The second distinct analytical criteria, the ability of the chemical staff as organized to accomplish its doctrinal duties, focuses on the linkage between the structure of the chemical staff and its doctrinal duties. The third and final analytic measure focuses on the division chemical staff's ability to meet the needs of the Army of the 21st Century. TRADOC Pamphlet 525-5, as the current gauge for the Army of the future, emphasizes five features of organizations of the future.

This monograph develops an alternative model that better meets these three analytical measures. This alternate approach emphasizes dispersing the current division chemical staff throughout the division coordinating staff with an eye towards the functions necessary for adequate staff operations. This new model narrows the gap between the warfighting doctrine and the staff operations doctrine. It improves the cross-functional, system-wide ability of the division staff. Finally, it looks to the future of TRADOC Pamphlet 525-5 by integrating the five design features of future organizations.

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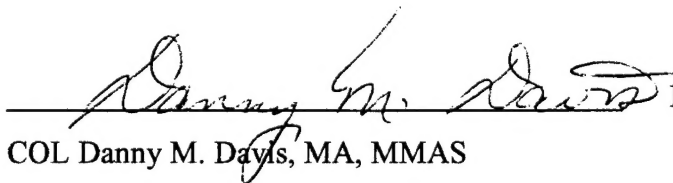
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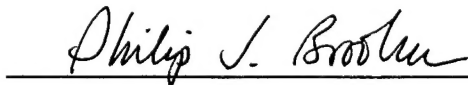
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Chapter 1 - Introduction, Background and Emerging Influences

Imagine the medieval sorcerer serving his king - an outsider with mystical powers unknown to the rest of the king's advisors. Expert in his art, the sorcerer provides his unique advice to the king, and is called upon only when the rest of the counselors are unable to resolve the kingdom's quandary. The sorcerer, consulting his tomes of incantations and manipulating his amulet, finally counsels the king, then disappears with a flourish into his locked tower, left alone to his magic until another crisis occurs. Similarly, the Division Chemical Officer serves the Division Commander as his modern day sorcerer (although with less melodrama), called upon to solve specific problems that only his expertise can accommodate, then forgotten or allowed to vanish into the dark reaches of the division headquarters to study his craft in solitude. The Division Chemical Officer and staff serve a unique function within the division staff - the staff focal point for all nuclear, biological and chemical (NBC) related matters. The division chemical staff organizes as a special staff to the commander, physically and intellectually separate from the coordinating staff elements, called upon to provide expert advice to the coordinating staff as necessary.

Unfortunately, this method of staff support appears to inadequately meet the needs of the commander. The current division chemical staff, deeply rooted in the past, remains a special staff to the commander, but seems incapable of fulfilling its role as the staff focal point for NBC matters. Fortunately, alternatives exist. This monograph argues that the current division chemical staff requires change to become a truly effective contributor to warfighting now and in the future. This monograph proposes a model that integrates the missions, functions, and people of the heavy division chemical staff

throughout the heavy division's coordinating staff by assigning chemical staff officers and personnel to each of the coordinating staffs. This model attempts to leverage the organizational structure of the division staff. It accommodates the innovative thoughts emerging from our pursuit of the Army of the 21st Century (as embodied in TRADOC Pamphlet 525-5).¹ This model also develops a solution that provides integrative, synergistic effects for the commander and staff through innovative and low cost organizational changes. Arguably, the alternate design proposed in this paper has faults. The alternative serves as an illustration, not a comprehensive, let alone singular, solution to the issues raised by this thesis. The significance of this paper lies more in its advocacy of the value of change than in its application to a particular example.

To support this thesis, this monograph develops three distinct criteria for assessing the current division chemical staff and the proposed alternative model. In introducing the thesis, Chapter 1 contends that the division chemical staff requires innovative reorganization to remain relevant to the division commander. It then describes the rationale behind the selection of the division chemical staff as the subject of analysis, and defines the fundamental concepts of special and coordinating staffs. The first criteria, developed in Chapter 2, focuses on the division chemical staff's ability to accomplish NBC defense doctrine - a linkage between organizational responsibilities and warfighting doctrine. This chapter discusses the history, current organization, and doctrine of the current division chemical section. It finds that a doctrinal gap exists between the doctrine that defines operations and the doctrine that defines staff functions. Some of this gap results from the history of the chemical staff. While warfighting doctrine and NBC operations doctrine have evolved, chemical staff doctrine has

remained fairly unchanged. Chapter 2 reveals a weak connection between the current division chemical staff's doctrinal duties and current NBC defense operations doctrine.

The second distinct analytical criteria, the ability of the chemical staff as organized to accomplish its doctrinal duties, emerges in Chapter 3. This criteria focuses on the linkage between the structure of the chemical staff and its doctrinal duties. Chapter 3 analyzes the division chemical staff compared to other special staffs in the division. In so doing, the chapter determines that the division chemical staff has responsibilities across all the functions of the coordinating staff but cannot accomplish those responsibilities because of the limitations of structure.

The third and final analytic measure focuses on the division chemical staff's ability to meet the needs of the Army of the 21st Century. TRADOC Pamphlet 525-5, as the current gauge for the Army of the future, emphasizes five features of organizations of the future. Organizations capable of rapid tailoring, with a focus on information, flexible in size, based on the division as the organizational foundation, and capable of providing modular combat support and combat service support meet the characteristics of our future Army. Chapter 3 analyzes the current division chemical staff against these characteristics and determines that this organization does not meet these future design features. When analyzed against these three criteria - the doctrinal linkage, the structural linkage, and future needs - the current division chemical staff fails to adequately meet any of the three measures of sufficiency.

Chapter 4 proposes an alternative model that better meets these three analytical measures. This alternate approach emphasizes dispersing the current division chemical staff throughout the division coordinating staff with an eye towards the functions

necessary for adequate staff operations. This new model narrows the gap between the warfighting doctrine and the staff operations doctrine. It improves the cross-functional, system-wide ability of the division staff. Finally, it looks to the future of TRADOC Pamphlet 525-5 by integrating the five design features of future organizations.

This paper uses the division chemical staff as illustrative of organizational change for several reasons. While this monograph relies primarily on the heavy division chemical staff as its model, the chemical staffs of light, airborne, and air assault divisions organize and operate similarly.² The broad and primary rationale for pursuing this organizational issue lies in the Army's continuing exploration into how to shape our future forces. Between the efforts of the Force XXI developers and the vision of TRADOC Pamphlet 525-5, our collective mind has expended a great deal of intellectual effort on the Army of the future. In an era of declining resources and increasingly more complex missions, division staffs (and the Army as a whole) need to find points of leverage to improve capabilities at least cost. Leverage, as defined by Peter Senge, focuses on the organization's ability to get maximum, long lasting improvement through small, well focused actions.³ TRADOC Pamphlet 525-5 projects the importance of organizational changes as critical to our future warfighting successes.⁴ Many other innovative thinkers and innovative theories provide organizational pathways to the future of warfighting. This monograph serves the reader as an experiment in organizational leverage - changing organizations to achieve long lasting improvements with small actions. By demonstrating the potential impact this simple change can make, the division chemical staff represents the kinds of organizational changes possible and necessary.

In selecting the division chemical staff, this monograph anticipates the continuing emergence of weapons of mass destruction as significant to our security interests, a supporting rationale for focusing on this staff section. The division chemical staff provides staff expertise in NBC matters, an area that has emerged as important, topical, and potentially critical to our success on future battlefields. NBC weapons fall into the category of Weapons of Mass Destruction (WMD), defined more by the effects of the weapons than by their characteristics or payloads. Field Manual 100-5, *Operations*, defines WMD as "weapons that through use or the threat of use can cause large-scale shifts in objectives, phases and courses of action."⁵ This definition seems to expand the old notion of NBC weapons from the tactical level of war to a more comprehensive, operational level perspective. In the recent past, our collective attention has been drawn to WMD by Iraq's reckless pursuit of this capability as well as the unexpected use by terrorists in Japan. Both these examples serve as more proof that nations and non-nations alike continue to perceive some advantage in possessing WMD.

Our concern about WMD manifests itself at all levels of national security. The President's National Security Strategy acknowledges the strategic implications of WMD, emphasizes the necessity of preventing and mitigating WMD use, and advocates the continuing national and international pursuit of NBC arms control initiatives.⁶ At the operational level of war, Joint Publication 3-11, *Joint Doctrine for Nuclear, Biological and Chemical (NBC) Defense*, includes a comprehensive discussion of theater NBC defense considerations.⁷ FM 100-5 provides both operational and tactical level perspectives, providing the combatant commanders with considerations in designing campaigns and emphasizing the importance of training and battle command to tactical

leaders.⁸ All these facts lead one to posit that, in the eyes of the United States, the possibility of a WMD battlefield in the future has not diminished with the end of the Cold War and may even have increased. Finally, this monograph analyzes the chemical staff as at division in support of TRADOC Pamphlet 525-5 argument that the division will be the major tactical formation of the Army of the 21st century.⁹

The distinction between special staff and coordinating staff officers serves as the baseline for any discussion of staff organizational concepts. The coordinating staff officers, as the commander's principle staff assistants, concern themselves with one or a combination of the broad fields of interest commonly associated with: personnel and administration; intelligence; operations, plans and training; and, logistics.¹⁰ Special staff officers, on the other hand, serve the commander as advisors in professional, technical, and unique functional areas.¹¹ As an illustration, the division's operations officer, the G-3, "is the principal staff officer in matters concerning operations and plans, safety, organizations, and training."¹² The division's chemical officer advises the commander and staff on the integration of NBC operations into all the coordinating and special staff areas of responsibility.¹³ These definitions imply a complementary relationship between these two advisors, one of breadth and depth. The coordinating staff functions more in breadth while the special staff functions more in depth. In addition, coordinating staff officers typically guide, direct and coordinate the efforts of special staff officers in areas of mutual interest.¹⁴ This symbiotic relationship appears sound in doctrine. However, the next chapter reveals that the doctrinal responsibilities of the division chemical staff do not meet the needs of current warfighting, or operations, doctrine.

Chapter 2 - History and Current Organization of the Division Chemical Staff

This chapter establishes the first of three measures for analyzing current and future division chemical staffs - the linkage between operations doctrine and staff doctrine. In so doing, this chapter demonstrates the discontinuity between the current chemical staff doctrine and the current NBC defense doctrine. It determines that any proposed alternative to the current division chemical structure requires a more direct connection between how to conduct operations in NBC conditions and how the division staff will act to conduct those operations.

Before embarking on any discussion of new or future models for the division chemical staff, the reader must develop an appreciation for the current division chemical staff. By reviewing and analyzing the historical lineage and current organization of, and doctrinal precedence for, the division chemical staff, this chapter provides a foundation of understanding on which the remaining sections build. This chapter makes no attempt to serve as an all inclusive historical survey. Instead, this discussion focuses on the key antecedents of the modern division chemical staff, first in the broad military history of the Chemical Corps since its inception in World War I, then through analyzing a 1960 staff study that serves as anecdotal for comparison with the modern division chemical staff. Following that brief and selective history, this chapter discusses the current organization of the division chemical staff and reviews the key doctrinal concepts of NBC defense, the primary mission of the division chemical staff. Once this foundation is established, this chapter concludes with an analysis of the division chemical staff's organizational capability to accomplish the Army's NBC defense doctrine.

A Brief and Selective History

The birth of the Chemical Corps resulted from the Army's attempt to deal with new, dramatic technological changes through organizational reforms. The Army established the Chemical Warfare Service (CWS) in 1918, three years after the first modern use of gas by the Germans near Ypres.¹⁵ While most scholars agree that the use of gas had little strategic effect on the outcome of the war, its impact at the tactical level shocked the Allies and precipitated a serious effort to develop both offensive and defense responses to gas on the battlefield.¹⁶ The United States decision to form the CWS focused on both technological initiatives and organizational changes. For this discussion, the key organizational change occurred with the establishment of gas officers at divisions. Unit gas officers previously existed at the desire of the division commander and were rarely formally trained in gas warfare defense. With this formal organizational change, division commanders could count on formally schooled and trained officers tasked with ensuring the training and readiness of the division's soldiers for gas warfare defense. The division gas officer became the staff focal point of all chemical warfare matters, not unlike today's division chemical staff.¹⁷

Following World War I and comparable to much of the post-war U.S. Army, the CWS suffered reductions and threatened extinction. According to Leo Brophy and George Fisher, in their official history of the CWS in World War II, the public revulsion of chemical warfare, the international pursuit of a treaty banning chemical warfare, and the War Department's perception that the CWS could be eliminated, all contributed to an atmosphere of self-preservation within the CWS.¹⁸ This tenuous existence encouraged the CWS leadership, particularly the Chief of the CWS, Major General Amos Fries, to

pursue political support outside the War Department and widened the rifts between the Army's field commanders and the apparently self-serving CWS.¹⁹ While chemical staff officers remained in divisions and continued to serve as the tactical commander's staff advisor, the distances between the technical capabilities of the CWS and the tactical requirements of the Army in the field widened as both sides focused their efforts on infighting in lieu of building effective fighting forces for the next war. Forty years later, the Chemical Corps again felt the shock of abrupt extinction as the Army briefly disestablished the Chemical Corps.²⁰ After three years in the ashes, this phoenix rose for the second time in its brief existence as a result of a renewed appreciation for the Soviet NBC arsenal (gained through our intelligence during the 1973 Arab-Israeli War).²¹ As expressed in Lieutenant Colonel Douglas Guiler's Army Magazine article, the Chemical Corps has fought for its existence almost continuously since its inception, having lost the fight at least twice.²² A certain amount of an instinct for institutional self-preservation seems to emerge after over seventy-five years of tenuous existence. Fortunately for both the Chemical Corps and the Army at large, our maturity of understanding the nature of future wars, as expressed in FM 100-5, seems to have mitigated those concerns.

While World War II and the Korean War saw no chemical warfare use, the division chemical staff officer remained directly involved in the chemical warfare defense training and readiness of the division. Doctrinally, two changes emerged during World War II that demonstrate some (minor) evolution in the chemical staff. First, the unit chemical officer became more involved in the planning and employment of chemical units. At the time, these units included smoke units and chemical mortar units capable of delivering chemical weapons.²³ Additionally, the recognition of biological warfare as a

potential new form of weapon caused the War Department to assign responsibility for biological warfare preparedness to the CWS.²⁴ As a possible sign of continuing recognition of chemical warfare on future battlefields, the War Department redesignated the CWS as the Chemical Corps in 1946, less than ten years after President Franklin Roosevelt refused to dignify chemical warfare by allowing the CWS the permanence implicit in the term Corps.²⁵

A review of the doctrinal literature of the period from 1946 through the early 1970s reveals few significant changes to the responsibilities and missions of the staff chemical officer.²⁶ Department of the Army Field Manual 3-9, *Staff Chemical Officer*, published in April 1955, accurately represents that nearly three decade stasis in duties. According to this doctrinal publication, the division chemical officer, with a four man staff, "has staff responsibility not only for the tactical and training aspects of CBR (chemical, biological and radiological) warfare as affecting the division, but for the supply of Chemical Corps materiel and ammunition to all subordinate units as well."²⁷ This manual further describes duties that include inspections, intelligence, staff advice on employment of chemical support units, smoke, incendiary and CBR weapons, participation in fire support coordination, and all CBR equipment supply and maintenance activities.²⁸

Some incremental evolution in responsibilities and organization did occur during the thirty year period after World War II. As the Army developed a more mature understanding of nuclear weapons and their effects through the 1950s and 1960s, the division chemical officer became involved in tactical nuclear weapons employment planning and became responsible for the management of NBC warning and reporting

systems. The entire concept of tactical protection against nuclear weapons effects expanded during the Cold War, with the chemical officer becoming increasingly focused on the scientific and medical aspects of radiation, including fallout prediction, contamination management, and radiation exposure guidance.²⁹ During the Vietnam War, the use of defoliants, herbicides and riot control agents by U.S. forces became the staff responsibility of the chemical officer. The 1960s and 1970s also saw the establishment of the CBR Element (later called the NBC Element), an organizational change that formalized the NBC hazard warning and reporting structure within the division.³⁰ The use of flame field expedients (fougasse and napalm) in Vietnam added renewed emphasis to a long forgotten duty of the chemical staff.³¹ However, when reviewed against the Army's doctrinal evolution over that same three decade period, these changes in duties and organization seem modest, even inconsequential.

While other studies arguably exist, a 1960 staff study, written by the Army's Chemical Corps Field Requirements Agency, indicates the nominal organizational changes in the division chemical staff spanning the period from 1955 to 1995. The study recommended an increase from an eleven to a sixteen man division chemical section, organized to support the division in three separate bodies - a CBR element located at the division's tactical operations center; a chemical logistics element at the division's logistics control center; and a command post element located with the division's main command post (or where the section can best coordinate and plan with the other division staff elements).³² Since 1955, the division chemical section incrementally increased in size corresponding with the incremental increase in duties (the addition of nuclear weapons and radiological hazards, for example). The study argued that this increase in size

resulted from a recognition of the increasing responsibility of the division chemical staff in the employment of nuclear weapons and their resultant effects. Additionally, the perceived increase in the quantity and types of chemical and biological weapons, particularly within the Soviet Union, precipitated a "many-fold" increase in the duties and responsibilities of the staff chemical officer.³³ Appendices 1 and 2 provide a detailed view of the responsibilities of the chemical officer in 1960 and the study's proposed division chemical section. When compared to the current division chemical staff organization and duties, this staff study suggests that the division chemical section changed only nominally during the forty years from 1955 to 1995.

An Evolutionary Crawl

The current division chemical staff mirrors its antecedents with only slight cosmetic changes. It remains, as its ancestors, a special staff charged with providing the division commander staff advice on all NBC matters within the command. This thirteen man staff section provides advice to the commander and staff "on all matters concerning the integration of ...NBC operational elements into plans, orders, operations, training, and other activities."³⁴ More specifically, the division chemical section, organized as the division chemical staff and the NBC center, provide support to the division tactical command post (TAC CP) and the division main command post (MAIN CP).

At the TAC CP, a smaller (typically three to four man) chemical staff coordinates and integrates chemical operations in support of the division's close battle. This section limits its activities and staff recommendations to the status of chemical units, enemy NBC weapons use, contaminated areas, and other information necessary for the division commander to manage near term combat operations.³⁵

At the MAIN CP, the division chemical section functions in three principle areas:

- ♦ coordination, integration, and synchronization of NBC units supporting the division;
- ♦ staff coordination, integration, and synchronization of NBC defense principles into combat operations;
- ♦ and, operation and management of the NBC warning and reporting system via the NBC Center.³⁶

As the focus of synchronization of NBC operations within the division, the MAIN CP chemical cell works directly with the coordinating staff and across all the combat functions. Physically, the NBC Center and MAIN CP division chemical staff locate separate from the central functional cells of the G-3, G-2 and Fires Cells (although commonly within the central cluster of vehicles).³⁷

In the late 1970s, the Army added an NBC Defense Company organic to all its divisions.³⁸ Prior to this organizational change, chemical troops normally came from higher echelon units (chemical battalions, brigades, and groups) providing support from the communications zone or theater level. The division chemical officer historically provided staff oversight of supporting chemical troops. This change added the duty of staff oversight of the division's organic chemical troops. Subsequent organizational changes moved the division chemical section from the headquarters and headquarters company of the division to the division's chemical (NBC defense) company.³⁹

Doctrine Divides

FM 101-5, *Command and Control for Commanders and Staffs* (Final Draft), and FM 3-101, *Chemical Staffs and Units*⁴⁰, provide the central doctrine for the division

chemical staff's duties and responsibilities. Unfortunately, these two doctrinal publications, published within months of each other, approach the issue at decidedly different angles. FM 101-5 discusses in great detail the chemical officer's responsibilities to advise the commander and work with the coordinating and special staff. To paraphrase, FM 101-5 tasks the chemical officer with managing and coordinating chemical personnel, chemical intelligence, chemical operations and chemical logistics for the division. This manual focuses the chemical officer's efforts on his supporting role to the commander and coordinating staff.⁴¹ Alternately, FM 3-101 emphasizes the chemical officer's role as coordinator of chemical units, going so far as stating that the division chemical officer has operational control (OPCON) of the divisional NBC defense company.⁴² This manual's authors include a checklist of those command and support relationship issues that the division chemical officer should solve regarding the division chemical company.⁴³ These two approaches, both with value and merit, create tensions among the chemical officer, the commander, and the coordinating staff. The chemical officer, given seemingly confusing doctrinal guidance, must manage his duties between his advisory, special staff role and his leadership role as senior chemical officer in the division. The OPCON relationship between the division chemical officer and the NBC defense company highlights the confusion resulting from these doctrinal approaches. These doctrinal aspects, while not mutually exclusive, can limit integration, coordination and synchronization of NBC matters with the combat functions of the division.

Having discussed the historical roots of the staff chemical officer and the apparently disjointed doctrine that defines his role on the current division staff, this chapter now shifts focus to the Army's doctrine for NBC operations and the relationship

between this warfighting doctrine and the doctrine defining the division chemical officer's duties. Two capstone doctrinal manuals - FM 100-5, *Operations*, and FM 3-100, *NBC Defense, Chemical Warfare, Smoke, and Flame Operations*⁴⁴ - provide the appropriate fundamental doctrinal concepts to frame this discussion.

FM 100-5, *Operations*, describes NBC warfare as weapons of mass destruction (WMD). WMD effects extend beyond the tactical battlefield, impacting on and being impacted by the strategic and operational levels of war.⁴⁵ Additionally, proliferation of these weapons to nations with regional security interests and conflicts has expanded the threat of WMD use on our forces. FM 100-5 approaches WMD and their effects holistically. It describes the combatant commander's options in dealing with WMD at the strategic and operational level of war. By combining conventional offensive and defensive measures, the operational commander may prevent WMD use on his forces through destruction of enemy capabilities or through deterrence based on risk reduction to friendly forces.⁴⁶ WMD, as a condition of the battlefield environment, effects war from the strategic level, through the operational level, and into the tactical level. The interactive nature of warfare tells us that WMD not only effects war but is effected by war.

At the tactical level, commanders must emphasize three areas - force protection, battle command, and contamination avoidance.⁴⁷ Force protection extends beyond masks and protective suits to dispersion, risk analysis and mitigation, training, and other passive measures. Battle command implies an appreciation for the difficulty in commanding under WMD battlefield conditions and emphasizes the commander's understanding of the tactical implications of reduced tempo and increased control problems. For a

commander to succeed, he must appreciate the influences this condition has on all functions of his command. In other words, the conditions resulting from WMD attack impact the physical depth and breadth of the battlefield. Finally, avoiding contamination through successful reconnaissance, dispersion, and flexibility in planning and execution "allows units to maintain tactical momentum and preserves combat power by keeping soldiers out of increase NBC protective posture."⁴⁸ Ultimately, training is key to successful tactical operations in an actual or potential NBC environment.

Published in 1991, FM 3-100, *NBC Defense, Chemical Warfare, Smoke, and Flame Operations*, provides several important and timely doctrinal concepts that require expansion. First, this manual addresses the NBC battlefield environment in relation to the combat functions (previously called battlefield operating systems). It distinguishes NBC as a condition of warfare, not a function or operating system.⁴⁹ While combat functions are actions performed by forces to accomplish the overall mission, battlefield conditions define the environment in which forces must perform the actions of combat functions. As an illustration, maneuver is an action in which forces move to gain a position of relative advantage against the enemy.⁵⁰ Forces maneuver during daylight, darkness, rain, and fog (all battlefield conditions). Forces should expect to maneuver during NBC conditions as well. This innovative concept about NBC on the battlefield may have fathered the discussion of WMD found in FM 100-5. At a minimum, these two capstone doctrinal manuals complement each other in their assessment of the impact of WMD. FM 3-100 emphasizes the importance of the commander's appreciation of the effects of WMD on his force. His combat power feels the influence of decisions to risk massing forces versus remaining dispersed to mitigate WMD effects. Additionally,

combat power and effectiveness erode as forces assume protective measures such as wearing protective equipment and conducting NBC reconnaissance.⁵¹ This manual carefully describes this cross-functional nature of the NBC environment by detailing the impact of NBC conditions on each of the combat functions.⁵² While less explicit, FM 100-5 acknowledges the effects of WMD as creating conditions in which forces may operate, reinforcing this concept of NBC as a condition of war.⁵³

Battle management, according to chapter 3 of FM 3-100, integrates NBC operational elements with the commander's intent and concept of the operations through direct involvement of the chemical staff and leaders. Particularly relevant to this analysis, this manual advocates direct and detailed coordination between the chemical staff and the coordinating and special staffs within the command. According to FM 3-100, "Battle management *requires* [author's emphasis] effective working relationships with not only the primary staff, but also with the special staff elements..."⁵⁴ This integrative approach to NBC operations involves the chemical staff in personnel, intelligence, operations, logistics, civil and public affairs, air defense, and fire support planning and execution.⁵⁵ By establishing battle management as an operating principle of NBC operations, FM 3-100 further emphasizes the cross-functional nature of NBC as a condition of warfare.

In summary, NBC defense doctrine, seen through the eyes of the authors of FM 100-5 and FM 3-100, suggests a holistic view of the battlefield and the effects of WMD on the battlefield. The system of battle command operates within the varying battlefield conditions, and the commander, aided by his staff, manages and leads the system with a view towards preventing the effects of WMD from tipping the balance in the enemy's

favor. These two doctrinal manuals complement each other, describing a systems approach to the WMD battle environment. Additionally, these manuals bring NBC defense and WMD effects into the context of the larger objective of the force - to fight and win under varying conditions. While the warfighting doctrines expressed in these manuals appear complementary, the staff doctrines described earlier seem to conflict with each other and with the operations doctrine they are meant to support.

A Rift in Doctrines

This chapter has detailed three main topics - the history, the current organization, and the doctrines that influence the division chemical staff. It establishes the conditions for the first analytical criteria for the division chemical staff, the link between warfighting doctrine and organizational doctrine. In so doing, this chapter demonstrates that, while the overall warfighting doctrine seems sound, the doctrine and organization intended to execute that warfighting doctrine lacks the unifying focus and systemic approach necessary. This chapter reveals the apparent discontinuity between the organization as it exists, and operates, and the Army's NBC defense doctrine. The doctrinal separation discussed in this chapter seems to limit the effective coordination, integration, and synchronization of the staff. The gap between the doctrine of staff responsibilities (described in FM 101-5 and FM 3-101) and the doctrine of combat operations (from FM 100-5 and FM 3-100) demonstrates the difference between a segmented, linear, disparate doctrine and a unifying, systems approach to warfighting. Additionally, and more remarkably, existing doctrines for staff operations conflict, confusing and blurring the division chemical officer's role as advocate of chemical units (a leadership focus) and his role as supporting the coordinating staff (an advisory focus).

The division chemical officer, unclear about his responsibilities based on doctrine, seeks out a middle ground founded in the pragmatic but apparently limiting his ability to serve either interest fully. These doctrines lack an integrative focus.

The next chapter shifts the focus of this study. That chapter studies the chemical staff in comparison to other special staffs in the division. Additionally, the next chapter analyzes the model for future organizational changes advocated in TRADOC Pamphlet 525-5. These two aspects, when added to the criteria established here, complete the framework for building an alternate for the future - the central goal of this paper.

Chapter 3 - Special Staffs, the Chemical Officer and the 21st Century - An Analysis of Roles, Responsibilities and Future Needs

This chapter serves two distinct purposes - it compares the salient features of the Division Chemical staff to other special staff sections; and it assesses the current division chemical section's organization and duties against the organizational design features described in TRADOC Pamphlet 525-5. In the end, these two analyses will yield the remaining analytical criteria necessary to frame the alternate design described in the next chapter. The analysis of the chemical staff compared to other select special staffs demonstrates the need to organize the chemical staff to provide support across all the functions of the coordinating staff. This analysis defines the second of the evaluative criteria - the ability of the chemical staff as organized to accomplish its doctrinal responsibilities.

Following this special staffs comparison, this chapter completes the analytical framework by defining the third analytical criteria as the chemical staff's ability to meet future needs. The five future organizational characteristics described in TRADOC Pamphlet 525-5 frame this third criteria. These characteristics, when applied to the current division chemical staff structure, reveal the inadequacy of the current structure to meet the needs of the Army of the 21st Century. This chapter completes the definition of the analytical criteria, finishes the analysis of the current division chemical staff, and sets the stage for a discussion of an alternative design.

Special Staffs Under the Microscope

As review, the special staff provides professional, technical, and other functional area staff advice and assistance to the commander. The special staff officers and their sections: assist the coordinating staff in developing plans, orders and reports; they train their own subordinates and provide staff assistance in the division-wide training of their technical or functional area; and, they coordinate and consult with other staff officers, both coordinating and special, as necessary.⁵⁶ In some cases, as this chapter will reveal, these special staff officers may also command units within the division.⁵⁷ Special staff officers at divisions typically include the Air Defense Coordinator, the Air Liaison Officer, the Aviation Liaison Officer, the Chaplain, the Chemical Officer, the Engineer Officer, the Fire Support Coordinator, the Headquarters Commandant, the Provost Marshal, the Signal Officer, the Staff Weather Officer, the Surgeon, and the Transportation Officer.⁵⁸

This discussion of special staffs highlights or focuses on the Provost Marshal, Engineer, and Signal Officer in comparison to the Chemical Officer for a number of reasons. In selecting these special staff officers, several characteristics establish basic similarities among this group. Each supports, by doctrine, the Division Operations Officer (G-3) as its coordinating staff focal point. Each selected staff functions as a combat support branch (versus a combat arms branch or combat service support branch). Finally, each selected staff manages a subordinate unit in the division.⁵⁹ Based on these criteria, the DivEng, SigO, and PM are appropriate to discuss and compare with the ChemO.

The Division Engineer Officer (DivEng) serves as both a special staff officer and the commander of the division's engineer unit (either brigade or battalion depending on the type of division). The DivEng, as a special staff officer and the locus of the combat function of mobility and survivability, supports the commander with staff advice and assistance about engineer units and engineer operations.⁶⁰ While staff doctrine describes the duties of the DivEng to include coordination with the G-2 and the G-3, doctrine does not detail his coordinating duties with other staffs in the division.⁶¹ As a commander, the DivEng is responsible for the daily operations of his unit, the health and welfare of its soldiers, the maintenance of engineer equipment, and the accomplishment of missions assigned by the division commander. Because of this dual responsibility, the DivEng normally relies on the Assistant Division Engineer (ADE) to manage the daily operations of the Division Engineer section.

The ADE, with staff, conducts the lion's share of coordination and integration with other special staffs, the coordinating staff, and subordinate units. The ADE plus staff totals six people.⁶² In combat, the DivEng, ADE and staff operate from all of the division's command posts - the TAC CP, the MAIN CP, and the division rear command post (REAR CP). The DivEng normally locates at the TAC CP, while the ADE heads the engineer planning and synchronization effort at the MAIN CP. At the REAR CP, engineer staff support augments the ADE and staff and focuses on supporting combat service support units with survivability and mobility operations.⁶³

The Division Signal Officer (SigO) serves the division commander and staff in much the same way as the DivEng. With both staff and command functions, the SigO splits his focus between his responsibility to coordinate all communications and

automation within the division and his command of the divisional signal battalion. In the role of special staff officer, the SigO advises the commander on all communications related matters in the division and the employment of signal assets and units.⁶⁴

As with the DivEng, the SigO relies on his Assistant Division Signal Officer (ADSO) and staff to carry out these staff functions routinely. The Division Signal office/staff accomplishes these tasks with nineteen to twenty-two authorized people.⁶⁵ While the SigO and ADSO provide signal staff support at the division's command posts, the TAC CP normally receives support from the ADSO's radio officer while the ADSO operates from the MAIN CP. The SigO normally divides his efforts between the MAIN CP and his signal battalion's command post. Current doctrinal publications do not address staff signal support to the REAR CP although this support likely exists within most divisions.⁶⁶ While the DivEng works selectively with the coordinating staff, the SigO and staff more directly and routinely interact with the division's coordinating staff - the G-1 through the G-4. By doctrine, the SigO advises the G-1 on the assignment of signal personnel within the division. The SigO coordinates with the G-2 on communications security (COMSEC) and electronic warfare procedures. Organization and employment of signal units requires coordination between the SigO and the G-3. The SigO, in coordination with the G-4 and the Division Support Command (DISCOM) Commander, manages signal supplies and equipment maintenance and issue.⁶⁷

In contrast to both the DivEng and the SigO, the Division Provost Marshal (PM) acts only in the capacity of special staff officer, without the additional role as commander. All divisions have an organic Military Police (MP) Company to which the PM and staff are assigned, although the organization of each of these MP companies

varies by type of division.⁶⁸ The PM advises the commander on all MP operations, focused on battlefield circulation control, security, and prisoner of war operations in the division's combat area of operations.⁶⁹ The PM exercises OPCON of MP units assigned to or supporting the division.⁷⁰ The PM works with the entire division coordinating staff. His staff, totalling six people including the PM⁷¹, supports the division by operating from both the MAIN CP and the REAR CP. This split operation concept enhances the PM's ability to ensure battlefield circulation control throughout the division's area of operations and provides the commander with a staff responsive to and responsible for rear area threats.⁷² (Appendix 5 provides a more detailed survey of the duties of each of these special staffs)

In summary, each of these combat support special staff officers has both similar features and unique features. All three provide staff planning, advice and assistance to the commander and his coordinating staff. Each manages, either directly or indirectly, subordinate units of the division. Finally, each coordinates throughout the division staff, synchronizing personnel, intelligence, operations, and logistics for their speciality. By doctrine, each operates across the combat functions with the goal of integrating their actions and capabilities in the division's overall operations.

Some unique qualities emerge from this survey as well. The DivEng and SigO serve as both staff officers and commanders, while the PM exercises OPCON of MP units in the division. The methods employed to provide staff support to the division's command posts vary widely - primary staff officer versus deputy/assistant, support to the REAR CP, etc. While the DivEng and SigO have counterpart staff officers in

subordinate units (maneuver brigades, for example) the PM has no staff representation below division.

Having detailed these special staff officers and drawn some preliminary conclusions about them, we now turn to a comparison with the division chemical officer. The most obvious conclusion appears to be that all these staff officers exist to integrate and synchronize their capabilities throughout the division. This conclusion reinforces the earlier observation that the doctrine of NBC staff operations and the NBC warfighting doctrine lack unity. In showing the unifying nature of these other special staffs' doctrines and organizations, this discussion reveals further that the chemical staff seems comparatively less well organized and prepared to operate across the combat functions, demonstrating a discontinuity between doctrinal duties and organization. As further evidence of this apparent chasm, the chemical staff retains several unique characteristics in its organization when compared to other special staffs.

A Unicorn Among Horses?

One different feature of the chemical staff results from an appreciation of NBC as a battlefield condition, effecting all aspects of the division. The technical expertise required to ensure all units in the division function in an NBC environment has lead to the formal establishment of NBC officers, NCOs and soldiers in every kind of unit at every echelon above platoon. Whether trained as an additional duty or trained formally, these special staff members provide commanders at all levels with readily available technical and tactical advice on NBC warfare and operations in an NBC environment. Engineer and Signal staff officers exist formally only at brigade level. Informally, the Engineer unit commander supporting a battalion may provide engineer staff advice and

assistance to the maneuver commander. The Signal platoon assigned to each maneuver battalion may provide similar ad hoc staff support. Neither exists formally in other combat support and combat service support units.⁷³ No MP staff officer or soldier exists below division level. Interestingly, engineer, signal and MP units in the division have NBC staff NCOs organic to their organization. Chemical staffs are different from other special staffs, then, because of their vertical links from company level to division level, a difference of depth.

These NBC staff soldiers advise commanders across the coordinating staff functions of personnel, intelligence, operations, and logistics. Commanders rely on these soldiers to ensure the unit's preparedness to operate in NBC conditions. This broadened, cross functional responsibility leads to a second different feature of the chemical staff. The division chemical staff (and its analogs at subordinate units) typically manage areas normally associated with the coordinating staff. Similar to the SigO, the division chemical staff often participates actively in the assignment of chemical soldiers within the division. FM 101-5 includes two personnel related duties - assess shortfall of NBC military operations specialties (MOSSs) and NBC personnel-readiness issues; and plan and recommend requirements for chemical soldiers.⁷⁴ Doctrinally, the senior chemical NCO in the division (a sergeant major) advises the commander on the distribution of chemical personnel within the division.⁷⁵ The DivEng likely participates in the assignment of engineers within the division, but more in his role as the commander of the engineer brigade, the normal destination for engineers in the division. The existence of MPs in only one unit in the division, the MP company, limits the PM's personnel management role to the PM staff.

In addition, the division chemical staff often oversees the division's chemical defense equipment budget, procurement, and distribution. Because every soldier in the division carries and/or uses NBC equipment, the Division chemical staff serves a unique role in logistics. From the division chemical staff to the company NBC NCO in the smallest combat service support company of the division, the division commander and staff have a vital interest in the supply, maintenance, and accountability of NBC equipment. This same interest applies to training every soldier in the operation of this equipment. Soldier survival may depend on the existence, proper functioning and proper employment of NBC equipment. No engineer equipment exists at the individual soldier level (save the entrenching tool). No signal equipment exists at the individual soldier level. Certainly no MP equipment exists at the individual soldier level. These two examples (chemical personnel and equipment) highlight the differences between the chemical staff's cross functional role and other special staffs' roles.

In summary, then, a comparison of the division chemical staff to other selected special staffs ultimately ends in an appreciation for the general similarities in duties of these special staffs and the comprehensive, integrative nature of their roles in the division. The differences described above - the nature of NBC as a condition, the invasiveness of NBC staffs throughout the organization, and the multi-functional nature of the NBC staff - all emphasize small differences. The duties of the chemical staff are system-wide, integrative duties. Unfortunately, the chemical staff organization is a separate, disparate, segregated organization. This duties-to-organization disconnect highlights the second of three evaluative criteria for an alternative solution - the linkage between staff structure and doctrinal duties..

A Litmus Test for Future Designs

Having looked at the current division chemical staff organization and how it compares to select special staffs in the division, this chapter turns its attention to an analysis of the organizational design features advocated in TRADOC Pamphlet 525-5 and how the current division chemical staff matches up to those features - the third and final defining measure of effectiveness. While TRADOC Pamphlet 525-5 does not establish the exclusive definition of the Army's future, it does describe, in a coherent, evolutionary approach, a structure for looking at future organizations.

TRADOC Pamphlet 525-5 champions five factors that require consideration when designing organizations for the Army of the 21st century.

First, it is essential that we be able to rapidly tailor organizations for operations. Second, we must organize around information processing and dissemination. Third, leader-to-lead ratio must change and be flexible for specific missions. Likewise, staffs may not be constant in size, but be tailorable to the mission. Fourth, we must organize around the division as the major tactical formation with the capability to tailor it for specific mission purposes. Fifth, combat support and combat service support must be modular, then capable of task-organizing for the mission.⁷⁶

In other words, 21st century organizations should be: rapidly tailorable; information focused; flexibly sized; division based; and modularly supported.

In assessing future staffs against these characteristics, we need to extend these factors from organizations in general to staffs in particular. Future staffs require similar, although not the same, features to support future organizations. For staffs, rapidly tailorable implies some redundancy of functions. In other words, a division staff may not deploy in total to a contingency. The reduced, deployed staff must maintain the same functional capability as the entire staff. Rapidly tailorable also implies the intellectual flexibility for ad hoc staffs to coalesce quickly. The second feature - information focus -

applies more directly to the staff as participants in the battle command function. Staffs must organize around information and its functions more so than along classic functional lines. Because information crosses over many functions, staffs must assume multi-informational and multi-functional capabilities. Next, flexible staff size further enhances the multi-functional capability of each module of the staff. The fourth feature of a division-based force, highlights the importance of the division staff. The final characteristic emphasizes modularity for support forces and staffs as well. These definitions serve as the final criteria for analyzing the current division chemical staff and the alternate design proposed in the following chapter.

Having established the definitions necessary for the third and final analytical criteria - a linkage of current organization to future needs - this chapter analyzes the current division chemical staff using these five factors. First, the current division chemical staff, organized functionally but separately, cannot rapidly tailor, providing a redundant capability to the staff modules supporting future forces. While that capability may exist situationally in divisions of the Army now, the doctrinal organization does not currently support an ability to provide chemical staff personnel with equal capabilities to disparate, distantly deployed staffs. For example, the NBC element can only function currently as a single entity. FM 3-101, *Chemical Staffs and Units*, defines the NBC element's duties narrowly and with an eye toward functioning separately from the coordinating staff. The structure and duties of the NBC element allow for no redundancy or modular support. Each member of the NBC element serves a very specific and narrow role.⁷⁷ The limited ability to organize in smaller, but fully functional components as

currently organized, prevents the chemical staff from accomplishing the first factor of future staffs - rapid tailorability.

Second, while the current organization focuses on information, its focus is specifically on NBC information. This information and its supporting structure do not cross functions. The chemical staff, organized separately from the other coordinating staff, manages NBC information outside the coordinating staff channels. Only after the information is collected and processed does the chemical staff disseminate it. Even then, this information flow tends to occur more between chemical staffs, and less across the coordinating staff or throughout the division.⁷⁸ If TRADOC Pamphlet 525-5 seeks to draw functions and information together, the division chemical staff must manage and disseminate NBC information across functions. That integration implies that staffs collect, process, and disseminate NBC information rapidly and widely. As organized now, this staff faces difficulties in creating that integration of function and information, the second feature of future staffs.

The current chemical staff operates along the rigidly defined structures of Tables of Organization and Equipment (TOEs) and doctrinal manuals. While Tables of Distribution and Allowances (TDAs) and other staff augmentation forms exist, flexibility remains somewhat limited. Flexibility in staff size, the third feature of future staffs, necessitates a less formal organization. While TOEs define the structure, they may limit flexibility in staff size by too narrowly defining specialties and ranks within the staff. Until staffs become less rigidly defined, the idea of flexibly sized staffs remains difficult to achieve.⁷⁹ In that respect, the division chemical staff is limited, but it is not unique in its limitations.

The fourth characteristic - a division-based focus - supports this paper's focus on the division chemical staff. As advocated in TRADOC Pamphlet 525-5, while the division will be the major tactical formation, it must be capable of tailoring to mission purposes. The current division chemical staff, as previously discussed, is division-based but lacks the ability to organize for different missions. As currently structured, the chemical staff, with a doctrinal focus on high intensity conflict, continues to struggle to support the commander in other missions, such as peace keeping, domestic assistance, and humanitarian aid.⁸⁰

The final feature of combat support and combat service support staff modularity further reinforces the concept of tailorable staffs. Modularity of combat support staffs might include expanding the branch specific duties of the current staffs to embrace the broader concept of combat support as a function. The current chemical staff seems limited, by its organization and its ethos, in its ability and willingness to expand beyond NBC to other combat support functions. This limitation may prevent the division chemical staff, as currently structured, from fully participating in the full dimensions of future operations.

By applying the future organizational features of TRADOC Pamphlet 525-5 to staffs, and more specifically the division chemical staff, the preceding discussion highlights the limitations of the chemical staff to meet the modular, tailorable, flexible designs of future forces. The constraints of operating as a single functional body, separate from the coordinating staff, precludes the chemical staff from providing readily available, accurate, and comprehensive NBC operations functions throughout the

division staff. Any alternate design should be better capable of overcoming those constraints.

In summary, this chapter adds the final two criteria to the three elements necessary in analyzing the current division chemical staff and any proposed future design. These two measures - how the division chemical section compares to other special staffs, and how the chemical section meets future design features of the Army of the 21st century - complete the analysis of the current organization. Chapter 2, a discussion of doctrine versus organization, concludes that the current chemical staff doctrine and organization insufficiently accomplish the current NBC operations doctrine - a discontinuity in doctrines. This chapter argues that the chemical staff, while similar in duties to several other special staffs but limited by its structure, inadequately meets its cross-functional responsibilities - a discontinuity in capabilities. Finally, this chapter demonstrates the limitations of the current organization to meet the modular, flexible, and responsive features of the 21st century division - a discontinuity in future needs. The next chapter proposes an alternative design that addresses each of these discontinuities.

Chapter 4 - An Alternate Design, An Integrative Approach

Up to this point, this paper has focused primarily on the current division chemical staff, its features and its limitations. This section addresses those limitations by proposing an alternate design. This alternate design features two central planning considerations - it should ensure no aggregate change in the numbers or rank structure of chemical personnel authorized in the division; and it should narrow the gaps in doctrine, responsibilities and future needs. The first of these considerations, maintaining chemical personnel numbers and ranks in the division, addresses the concerns of force developers and Chemical Corps leaders over reducing the numbers of chemical soldiers in the division. If one accepts that the Chemical Corps has a role in the current and future divisions as FM 100-5, our National Security Strategy, and recent events indicate, then maintaining a Chemical Corps presence implies maintaining chemical soldiers within the division. Additionally, and partly because of the historic precedents after World War I and Vietnam, many opponents to changing the division chemical section fear the threat (real or perceived) of another attempt to eliminate the Chemical Corps from the Army. A willingness to reduce chemical soldiers in divisions might signal a willingness within the Army to shift from reduction to wholesale elimination. While this fear relies more on emotion than fact, this first planning consideration allows for that concern. The second planning consideration emerges from the conclusions drawn in the previous two chapters of the paper and frames the design principles for this alternative.

An Integrative Model for Change

As described in this paper's introduction, this new model integrates NBC operations capabilities throughout the coordinating staff by assigning the thirteen chemical staff officers and NCOs of the current division chemical section to the coordinating staff. Appendix 6 provides a graphic guide to this proposed design and should assist in following the changes described below. Specifically, the division chemical officer, a lieutenant colonel, remains as a special staff officer to the division commander. His duties and responsibilities remain generally unchanged. However, his deputy, the tactical chemical operations officer (a major), becomes an assistant G-3, Chemical, with duties comparable to brigade and battalion chemical officers. The NBC officer, a captain currently organized in the NBC element, becomes the tactical chemical officer, working for the Assistant G-3, Chemical, and operating at the Division TAC CP. In addition, the chemical operations NCO of the NBC element, a master sergeant, becomes the G-3's tactical NBC NCO, forming the other half of the tactical chemical section at the TAC CP. Finally, the assistant chemical operations NCO, a sergeant first class, moves to the G-3, and retains the current duty title. These three staff members become the chemical plans and operations section, operating at both the MAIN and TAC CPs, and integrated in the G-3 staff.

The G-2 section receives the NBC Element's Chemical Officer, a captain, and the NBC NCO, a staff sergeant, to provide NBC technical intelligence and analysis, both in planning and during operations. This NBC intelligence section likely operates at the MAIN CP.

The Senior NBC Staff NCO, a sergeant major, moves to the G-1 section, becomes the Rear Battle Chemical NCO, and provides staff integration of NBC matters for the REAR CP. Additionally, this sergeant major assumes responsibility for coordinating the assignment of chemical soldiers within the division. The NBC Element Computer Plotter, a staff sergeant, moves to the G-1 section and becomes the Assistant Tactical Chemical NCO in support of the Rear Battle Chemical NCO. Two sergeants first class, the NBC Staff NCOs of the Division Chemical Section and NBC Element, become the NBC Supply Sergeant and NBC Maintenance NCO of the G-4 section, serving at the REAR CP and completing the Rear Battle Chemical Section. This section not only coordinates NBC administrative and logistics issues, but supports the Rear Battle Chemical NCO in coordinating NBC operations in the division's rear area. Finally, the remaining two soldiers, both clerk/typists, support the Division Chemical Officer and the Rear Battle Chemical NCO as drivers and clerks. Appendix 7 graphically depicts this proposed organization, showing the division's command posts in functional form.

Some Criticisms Addressed

A quick review of the numbers and ranks of the chemical soldiers in this design reveals that it adequately accomplishes the first design consideration discussed in this chapter's introduction - maintenance of the numbers and ranks of the division chemical personnel. However, opponents of this design may find any number of faults. Many would argue the allocation of particular ranks and numbers to the particular staff sections. Some might ask why the Chemical SGM is assigned to the G-1 and not to the G-3. From that perspective, this design is but one of many possible variations on a theme. As discussed in this paper's introduction, the critical issue raised in this

monograph lies at the desired effects of the change, not the details. This paper makes no attempt to address each and every detailed concern raised by this proposed design.

Rather, this design serves as a model or framework which captures the intent of this paper - to recognize the limitations of the current structure and advocate change focused on the issues addressed in chapters 2 and 3 - the rift in doctrines, the rift in responsibilities, and the rift in future needs.

Other critics might argue that certain real-world core duties get diluted or eliminated in this design. From a practical view, the operation of the NBC warning and reporting system by the NBC element appears to disappear. Additionally, most division chemical staffs operate an NBC school that provides additional duty training for non-chemical officers and soldiers. Another practical concern might be ensuring chemical staff officers and NCOs, spread throughout the division staff, maintain their focus on chemical staff duties when pressured to assume other roles within their coordinating staff (such as the NBC staff NCO in the G-3 becoming an operations NCO). Each of these have possible solutions. For example, the NBC warning and reporting system, intended to operate within the context of normal tactical operations, simply requires cooperation between the operations staff and the chemical staff to ensure success. As both an intelligence and operations information system, the NBC warning and reporting system influences and interacts horizontally with all the coordinating staffs (G-1 through G-5) and adjacent units, and vertically from subordinate units (battalions and brigades) up to higher headquarters (corps and higher). The proposed design provides NBC staff personnel to each of the coordinating staffs, providing improved horizontal information flow. In other words, the NBC warning and reporting system

succeeds when all echelons recognize it as part of the normal command and control framework. Additionally, technologies continue to emerge that will allow this NBC information to pass more rapidly and more broadly with far less people required to manage the system.⁸¹

The chemical staff designated for the G-3 section could run a quarterly NBC school for the division. As both professional and technical development, chemical soldiers from subordinate units could serve as an instructor pool. With a Major in the G-3 section, coordination with the Assistant G-3 for Training improves under this design. Concerns about misuse of chemical soldiers, while a continuing anxiety, requires the involvement of chemical leaders throughout the division. From the Division Chemical Officer and the Chemical Sergeant Major down, leadership solves these issues. Additionally, the advantages of using chemical NCOs as assistant operations sergeants or chemical officers as assistant training officers, plans officers, or operations officers has proven its value in the past. The unit benefits because NBC becomes integrated in the overall operation much earlier, and the staff gains a better, more robust understanding of the battlefield environment.

As a model for success, the brigade chemical officer exemplifies the integrative value of this relationship. The brigade chemical officer serves as an assistant S-3 as well as the chemical staff officer. Doctrinally, he recommends to the brigade S-1 the assignment of chemical soldiers within the brigade, he informs the brigade commander about enemy NBC capabilities, he manages the NBC warning and reporting system integral with the brigade's command and control network, and he supervises subordinate units NBC equipment maintenance, accountability and requirements.⁸² Brigade chemical

officers and NCOs routinely act as assistant S-3s or operations NCOs, normally resulting in a chemical staff with a comprehensive tactical understanding and an integrative approach to NBC operations.⁸³

Testing the Design's Value

While the above discussion addresses some of the more practical concerns about this proposed design, the real assessment of its worth lies in its ability to satisfy the criteria laid out in chapters 2 and 3. Having accomplished the first design consideration, this section focuses on the second consideration - the evaluative criteria established in chapters 2 and 3. To review, the design had to address three criteria: first, does this design better link warfighting doctrine to organization?; second, does this design better organize the staff to manage the integrative nature of NBC warfare?; and finally, does this design better accomplish the organizational needs of the Army of the early 21st century?

Chapter 2 described the first criteria as the link between the holistic, systems approach of the warfighting doctrines and supporting staff doctrines. The current division chemical staff, attempting to execute a systems approach to warfighting with a linear staff doctrine, appears unprepared to meet expectations fully. This alternate design addresses that criteria by establishing an integrative division staff structure that better allows for a systemic approach to war. While this different design does not change doctrine, it does provide a catalyst for doctrinal change. It strips away the intellectual limits imposed by organizational structure, clearing a path for doctrine to follow. In that way, this alternative model better links warfighting doctrine to organization.

By re-organizing the division chemical staff, this model better appreciates and addresses the integrative nature of NBC warfare as a condition, the second evaluative criteria. The current organization operates separate from the division coordinating staff, but has many integrative duties described by doctrine. The proposed model, by integrating the capabilities of the chemical staff with the duties of the coordinating staff, merges integrative doctrine with integrative structure, better linking organization to duties.

This alternate design better supports the design features of the Army of the 21st century. By divesting the NBC expertise throughout the staff, this model increases the division staff's ability to organize modularly and flexibly. With the division staff as the core structure, this model allows for the five features of Force XXI - rapidly tailorable, information focused, flexibly sized, division based, and modularly supported. It can organize for differing environments using all the staff expertise available, focusing on information. In that way, this proposed design adds the benefits of integrating NBC expertise throughout the staff with the increased flexibility that integration creates.

Each of these three criteria are qualitative measures - how well a particular model or design meets the criteria defined. Measured qualitatively this model better accomplishes the defined criteria than does the current division chemical staff structure.

Chapter 5 - Summary

This monograph set out to demonstrate the limitations of the current division chemical staff and to propose an alternative that better addresses the integrative, holistic environment of war now and in the future. In so doing, this monograph illustrates the kinds of simple organizational changes available and the potential for these changes to make long lasting, permanent improvement to organizations.

This discussion began with a review of the historical influences, both doctrinal and organizational, that fathered the current division chemical staff. From its origins in World War I, through the inter-war years and the cold war, the division chemical staff slowly, almost negligibly evolved into its current form. Having established this foundation, an analysis followed, contrasting current operations doctrine with current staff organization doctrine and providing the first of three design features - a linkage between operations doctrine and staff doctrine - lacking in the current chemical staff and necessary in any alternate approach. FM 100-5, the Army's capstone doctrine, and FM 3-100, the Army's capstone NBC doctrine contrast markedly with the staff doctrines detailed in FM 101-5 and FM 3-101. The holistic, systems approach of the capstone doctrines looks forward while the linear, disparate staff doctrine stands still.

Next, a review of other special staffs revealed both the similar and uncommon features of the chemical staff and defined the second necessary measure of the old and new models, the linkage between staff structure and staff duties. These uncommon features - the nature of NBC as a condition, the invasiveness of NBC staffs throughout organizations, the cross functional nature of the NBC staff, and the duty to operate the

NBC warning and reporting network - serve as additional evidence that the current structure lacks effective linkage to its doctrinal duties.

The third and final benchmark, the staff's ability to meet future needs, emerged from an examination of organizational design features for the Army of the 21st Century. TRADOC Pamphlet 525-5, the intellectual engine of current Army thinking, advocates five characteristics - rapid tailorability, an information focus, flexibility in size, division based, and modularly supported by combat support and combat service support forces. The process of determining these three criteria confirmed the limitations of current division chemical staff. As currently structured, the division chemical staff fails all three tests - it fails to narrow the distance between doctrine and organization; it fails to provide cross-functional, system-wide capability to the division staff; and it fails to meet the design features of future staffs.

Having established the criteria for improvement and having demonstrated the deficiency of the current structure, the fourth chapter of this monograph suggests an alternate design that addresses near-term and pragmatic personnel concerns and accomplishes the goal set by the three design criteria. This new design protects the current numbers and ranks of the division chemical staff, but integrates the functions throughout the coordinating staff. Specifically, this alternate design assigns the chemical staff personnel to the coordinating staff, providing chemical staff functions to all the division's command posts and coordinating staff. In describing this proposed change, chapter 4 addresses some probable criticisms.

This paper demonstrates that, while the Division Chemical Officer remains an important part of the Army of the future, changes are necessary to ensure that

importance. Those seemingly small changes may eventually yield large and enduring benefits. This monograph sets out to develop an organizational alternative that emphasizes integration and synergy among staffs, using the Division Chemical Officer as its model of change. In so doing, this paper illustrates of the kinds of changes the Army can, and should, begin to consider to reach the goals of TRADOC Pamphlet 525-5 and the full dimensional Army of the 21st century.

*Appendix 1 - Responsibilities of the Chemical Officer (1960)*⁸⁴

- a. Advises the command and his staff on CBR matters including the planning and coordination of the use of chemical and biological agents, weapons, and munitions in offensive operations.
- b. Supervises the determination of requirements for, and the requisitioning, procurement, distribution, storage, and documentation of, Chemical Corps supplies, munitions, and equipment.
- c. Plans and recommend requirements for, and employment of, Chemical Corps troops.
- d. Prepares and supervises training programs of Chemical Corps units under his operational control, and exercises technical supervision over CBR training throughout the command.
- e. Exercises technical supervision over the following CBR operations.
 - (1) Monitoring of CBR contaminated areas and decontamination of these areas.
 - (2) Planning for and use of chemical (toxic, smoke, flame, and incendiaries), and biological agents in tactical operations.
 - (3) Planning and coordination of CBR surveys.
 - (4) Maintenance and repair of Chemical Corps equipment and supplies, field impregnation of clothing, and field filling of Chemical Corps munitions.
 - (5) Technical inspection of Chemical Corps equipment and supplies, to include organizational maintenance of such equipment and supplies.
 - (6) Recovery, evacuation, maintenance, and reclamation of Chemical Corps materiel beyond the capabilities of using units.
 - (7) Examination and processing of captured CBR materiel.
 - (8) Technical intelligence pertaining to CBR warfare.
 - (9) Prediction of fallout from nuclear weapons.
 - (10) Prediction of CBR casualty-producing effectiveness and degree of hazard of chemical and biological agents.

(11) Planning for the use and servicing of flame throwers and flame field expedients.

f. Maintains CBR situation maps.

g. Disseminates CBR contamination charts as required.

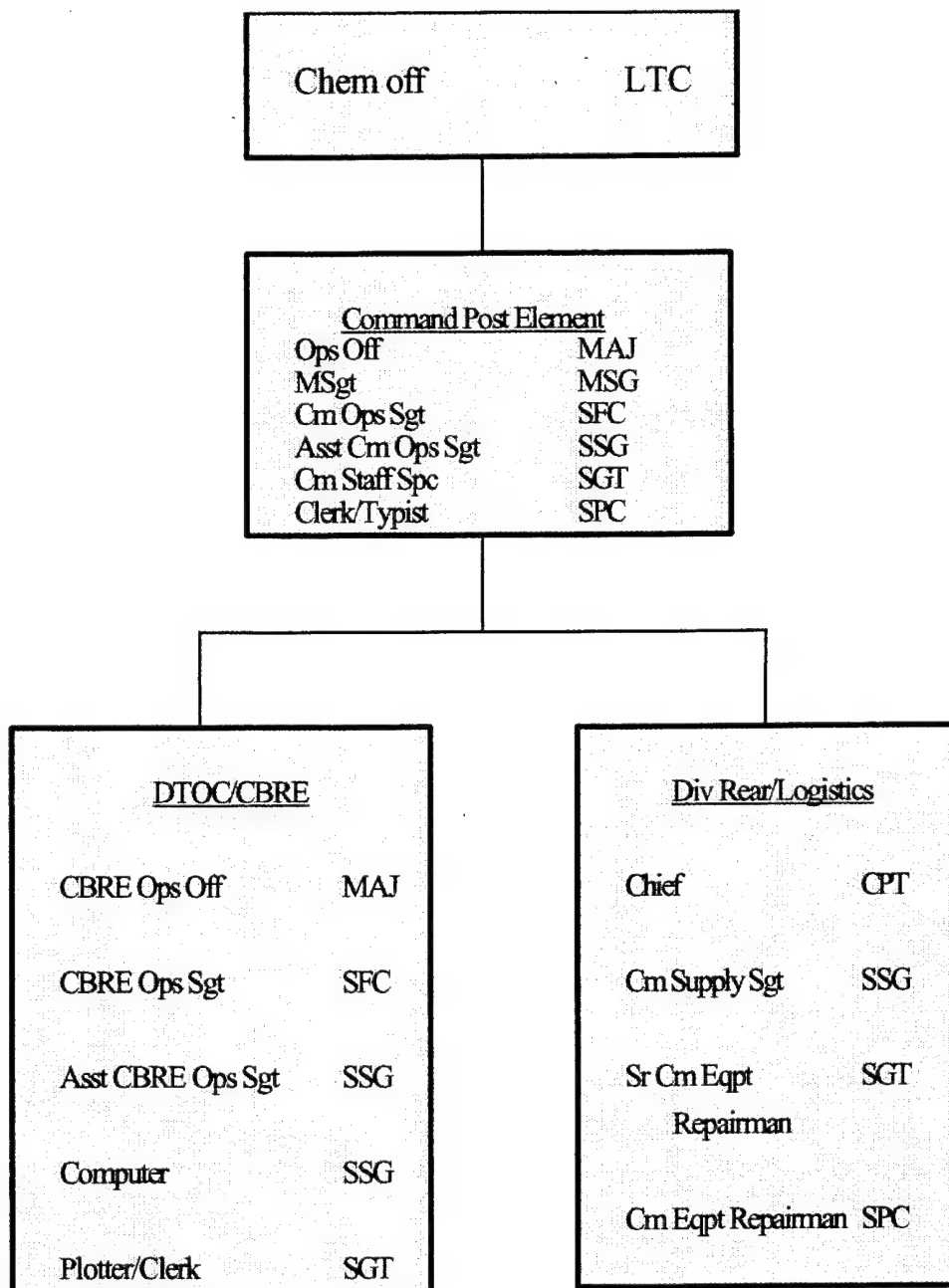
h. Supervises the equipment status reporting system within his area of responsibility.

i. Advises the commander and staff on CBR defense and prepares CBR defense plans.

j. Assists in planning chemical participation in barrier and denial operations when CBR activities are involved.

k. Supervises the operation of CBR schools within the command.

Appendix 2 - Proposed Division Chemical Section⁸⁵



Appendix 3 - Responsibilities of Chemical Officer (1993)⁸⁶

The Chemical Officer--

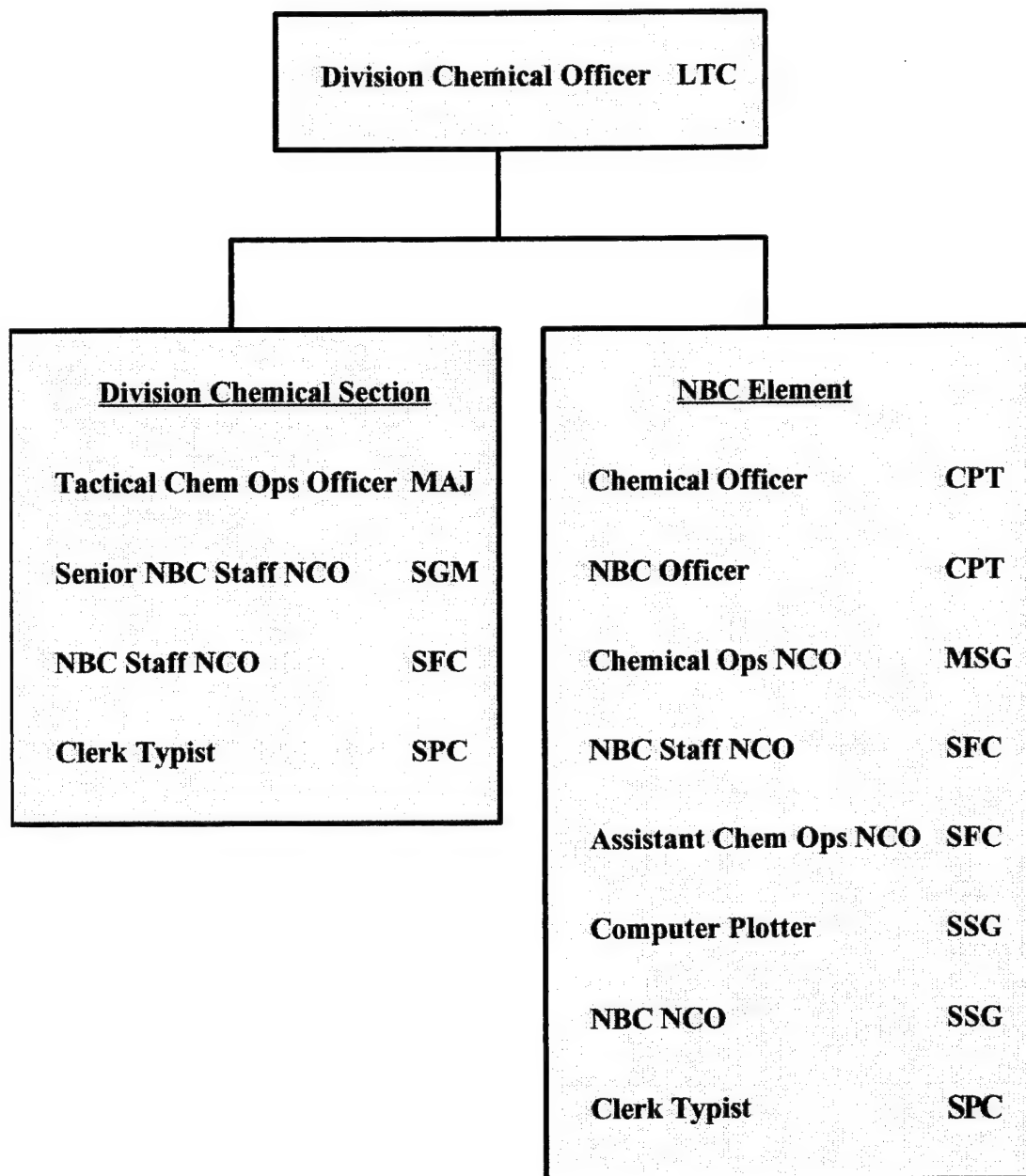
- ♦ Advises the commander and staff on all matters concerning the integration of the following NBC operational element into plans, orders, operations, training, and other activities:
- Battlefield assessment and risk analysis.
- Nuclear, biological, and chemical warning and reporting.
- Nuclear, biological, and chemical defense including avoidance of NBC hazards, detection, protection of personnel and equipment, and decontamination.
- Nuclear, biological, and chemical reconnaissance.
- Smoke operations.
- Flame operations.
- Nuclear employment operations (corps only).
 - ♦ Assesses shortfalls of NBC MOSs and NBC personnel-readiness issues.
 - ♦ Assesses probability and impact of NBC-related casualties.
 - ♦ Ensures field medical support is prepared for an NBC attack.
 - ♦ Assesses weather and terrain data to determine whether or not environmental factors are conducive to enemy employment of NBC weapons, or at the corps level only, friendly employment of nuclear weapons.
 - ♦ Assists with IPB.
 - ♦ Analyzes enemy NBC capability, including types of agents, obscurants and sensors, protective posture, line-of-sight (LOS) influences on direct fire systems, and friendly vulnerability to enemy strengths.
 - ♦ Recommends COAs to minimize friendly and civilian vulnerability to attack.
 - ♦ Assists in war-gaming COAs.
 - ♦ Provides advice on MOPP; troop-safety criteria; OEG; priorities for limited NBC defense resources; task organization of chemical units; smoke, decontamination,

and NBC reconnaissance; flame operations, impact of NBC-related attacks on current and future operations, mitigating techniques, and priorities for actions.

- ♦ Verifies enemy first-use of CB warfare agents.
- ♦ Predicts downwind vapor hazard and fallout patterns and their probable effects on operations.
- ♦ Develops CB and radiological survey plans.
- ♦ Develops radiological monitoring plan.
- ♦ Collates, evaluations, and distributes CB and nuclear contamination data.
- ♦ Prepares CB and nuclear situation reports (SITREPs).
- ♦ Maintains chemical and nuclear accident and incident and response and assistance plans.
- ♦ Recommends actions to clear obstacle and hazards created by enemy NBC weapons.
- ♦ Oversees use of earth-moving equipment in NBC decontamination.
- ♦ Maintains and reports cumulative radiation dose statuses.
- ♦ Estimates effect of a unit's RES on mission assignments.
- ♦ Participates in the nuclear target-nomination process (corps only).
- ♦ Plans, coordinates, and evaluates the NBC training program in cooperation with the G3.
- ♦ Estimates consumption rates of NBC defense equipment and supplies.
- ♦ Advises on positioning of decontamination materials and personnel, establishing fixed or mobile decontamination capabilities.
- ♦ Coordinates with the G5 (S5) on integrating HN assets into decontamination operations and utilizing existing facilities for field-expedient protective shelters.
- ♦ Identifies NBC obstacles.
- ♦ Oversees construction of NBC shelters.
- ♦ Plans and recommend requirements for chemical soldiers and their employment.

- ♦ Prepares the NBC defense and smoke annexes to plans, orders, NBC estimates, and SOPs.
- ♦ Recommends employment of defoliants and herbicides in support of tactical operations.
- ♦ Plans and recommends integration of smoke into tactical operations.
- ♦ Conducts smoke target development.
- ♦ Plans and recommend use of flame-field expedients to support unit defense and existing minefields and barriers.
- ♦ Maintains the NBC situation map, NBC overlay, and smoke support overlay.

Appendix 4 - Division Chemical Section⁸⁷



Appendix 5 - Duties and Responsibilities of Selected Special Staff Officers⁸⁸

The Division Engineer (DivEng)

The DivEng, as a special staff officer and the locus of the combat function of mobility and survivability:

- ♦ provides advice to the division commander and staff on engineer unit capabilities and employment;
- ♦ conducts staff planning and coordination for countermobility missions such as construction of obstacles, employment of mines and minefields, and road cratering;
- ♦ conducts staff planning and coordination for breaching or clearing obstacles and minefields, road maintenance, river crossing operations, and other mobility-related missions;
- ♦ conducts staff planning for construction of defensive positions with focus on survivability;
- ♦ provides engineer intelligence assessments and intelligence preparation of the battlefield (IPB);
- ♦ prepares the engineer portions of plans, orders and reports; and, oversees engineer training within the division.

The Division Signal Officer (SigO)

In the role of special staff officer, the SigO's duties include:

- ♦ advising the commander, staff and subordinate units on all signal and communications matters within the division;

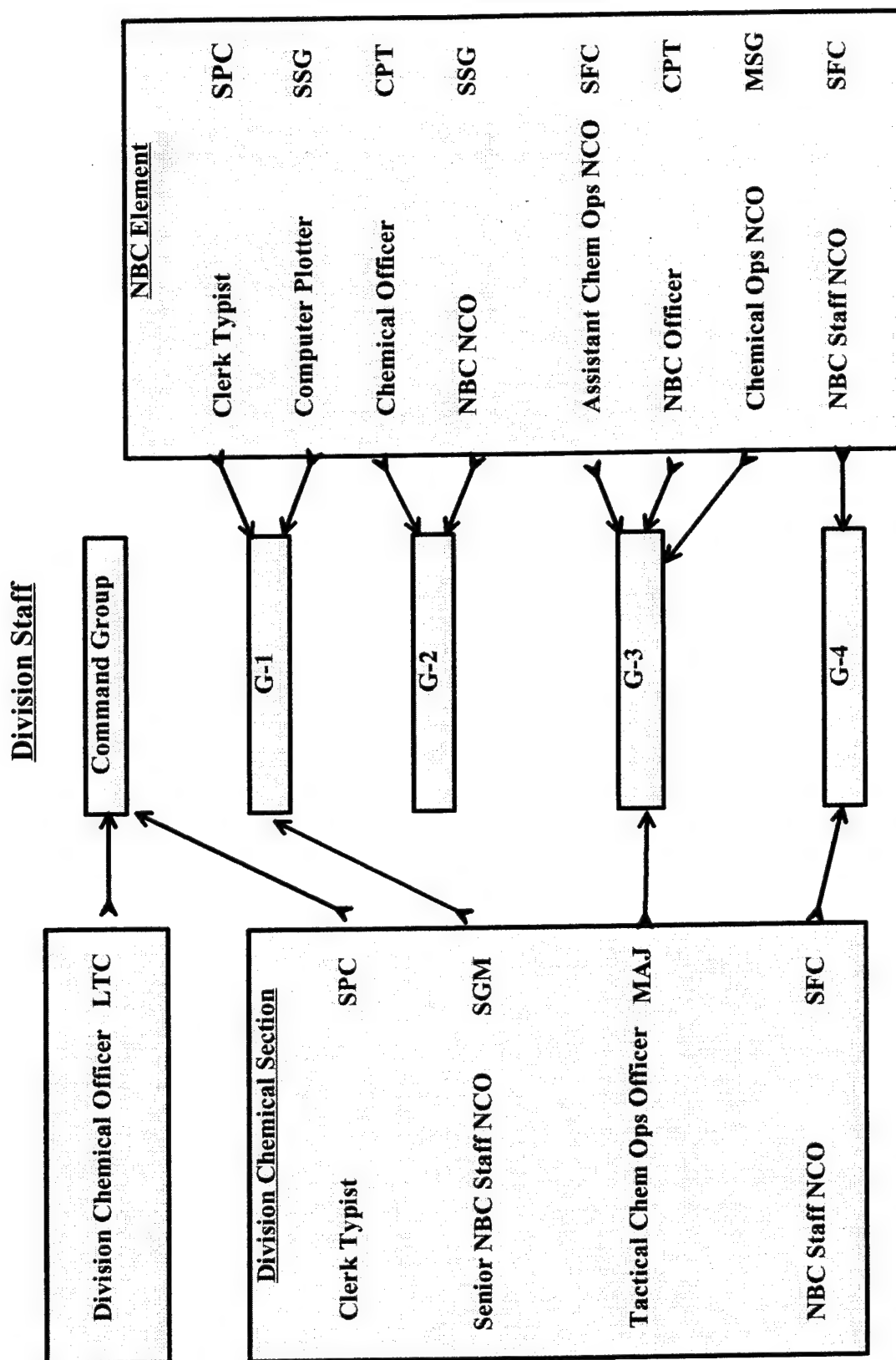
- ♦ supervising the technical aspects of signal activities and communications within the command;
- ♦ managing all communications security (COMSEC) matters;
- ♦ acting as staff supervisor for information management and automation matters;
- and,
- ♦ developing communications plans, orders, estimates and reports for the coordinating staff.

The Division Provost Marshal (PM)

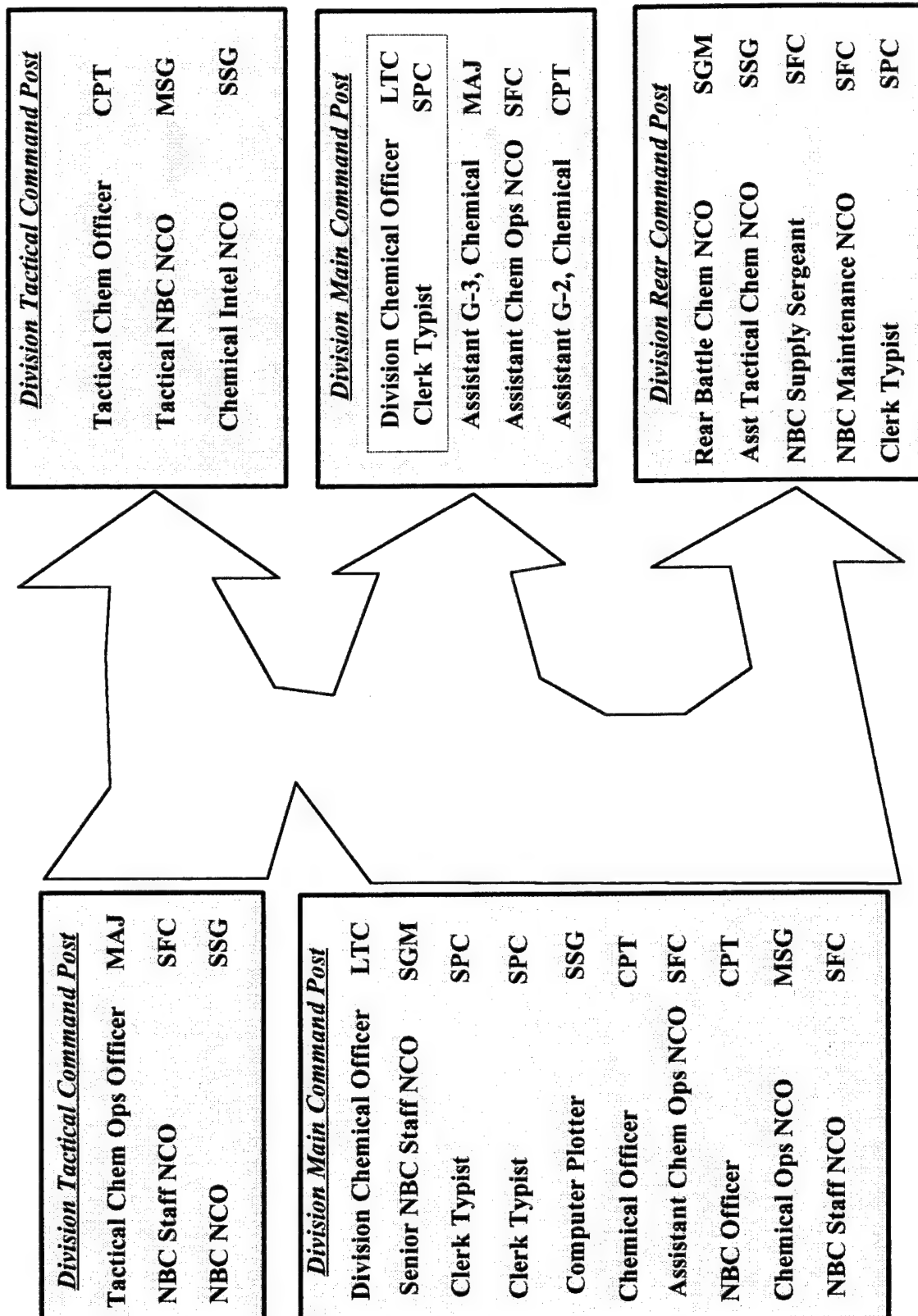
The PM:

- ♦ coordinates MP operations in the division area of operations;
- ♦ prepares plans, policies, estimates, and reports;
- ♦ exercises operational control (OPCON) of organic and attached MP units; and,
- ♦ advises the commander on the employment of MP units and assets.⁸⁹

Appendix 6 - Current to Proposed Chemical Staff - The Structural View



Appendix 7 - Current to Proposed Chemical Staff - The Functional View



Endnotes

- ¹ U.S. Army Training and Doctrine Command, *TRADOC Pamphlet 525-5 - Force XXI Operations: A Concept for the Evolution of Full-Dimensional Operations for the Strategic Army of the Early Twenty-First Century*, (Fort Monroe, VA: Headquarters, U.S. Army Training and Doctrine Command, 1 August 1994).
- ² Force Developments Branch, Concepts and Studies Division, Directorate of Combat Developments, U.S. Army Chemical School, Chemical TOE Summary Book, (Fort McClellan, AL: U.S. Army Chemical School, May 1995), 1-8.
- ³ Peter M. Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, (New York: Doubleday, 1990), 64.
- ⁴ TRADOC Pam 525-5, p. 3-3.
- ⁵ Department of the Army, *Field Manual 100-5: Operations*, (Washington, DC: Department of the Army, June 1993), Glossary-9.
- ⁶ The White House, *A National Security Strategy of Engagement and Enlargement: July 1994*, (Washington, DC: U.S. Government Printing Office, 1994), 7.
- ⁷ Joint Chiefs of Staff, *Joint Publication 3-11: Joint Doctrine for Nuclear, Biological and Chemical (NBC) Defense*, (Washington, DC: Joint Chiefs of Staff, 15 April 1994), Chapter III, pp. III-1 - III-5.
- ⁸ *Field Manual 100-5 - Operations*, pp. 6-10 - 6-11.
- ⁹ TRADOC Pam 525-5, p. 4-5.
- ¹⁰ Department of the Army, *Field Manual 101-5 - Command and Control for Commanders and Staff (Final Draft)*, (Fort Leavenworth, KS: U.S. Army Command and General Staff College, August 1993), p. 2-6.
- ¹¹ Ibid., p. 2-9.
- ¹² Ibid., p. 3-15.
- ¹³ Ibid., p. 3-44.
- ¹⁴ Ibid., p. 2-9.

¹⁵ Leo P. Brophy and George J. B. Fisher, *The Chemical Warfare Service: From Laboratory to Field*, United States Army in World War II - The Technical Services, Vol II, (Washington, DC: Office of the Chief of Military History, United States Army, 1959), 12.

¹⁶ Charles E. Heller, *Leavenworth papers Number 10 - Chemical Warfare in World War I: The American Experience, 1917-1918*, (Fort Leavenworth, KS: Combat Studies Institute, U.S. Army Command and General Staff College, September 1984), and Frederic J. Brown, *Chemical Warfare: A Study in Restraints*, (Princeton, NJ: Princeton University Press, 1968), 37. Heller's work probably provides the best, most concise account of the use of gas in World War I as well as the American response. Particularly important are his conclusions which continue to sound familiar to Chemical Corps soldiers and combat arms leaders in today's Army.

¹⁷ Heller, 50.

¹⁸ Brophy & Fisher, 22-23.

¹⁹ Frederic J. Brown, *Chemical Warfare: A Study in Restraints*, (Princeton, NJ: Princeton University Press, 1968), 77-82.

²⁰ "Chemical Corps Comeback: Rebuilding Chemical Capabilities," *Soldiers*, April 1977, 12.

²¹ Douglas C. Guiler, Jr., "Chemical Corps: A Branch in Search of an Identity," *Army*, November 1977, 12.

²² Ibid., 13-14.

²³ Brooks E. Kleber and Dale Birdsell, *The Chemical Warfare Service: Chemicals in Combat*, United States Army in World War II: The Technical Services, Volume I, (Washington, DC: Office of the Chief of Military History, United States Army, 1966), 82.

²⁴ Ibid., 47-48.

²⁵ Ibid., 657, and Brophy and Fisher, 21-22. The U.S. Presidents during the interwar years actively pursued a ban on chemical weapons as inhuman and unnecessary. Both Hoover and Roosevelt opposed the permanent establishment of the Chemical Corps as counter to their stated personal and official policies

²⁶ War Department, *Field Manual 101-5 - Staff Officers' Field Manual: Chapter 1 - Staff Principles and Functions*, (Washington, DC: War Department, 25 June 1928); War Department, *Field Manual 101-5 - Staff Officers' Field Manual: The Staff and Combat Orders* (with changes 1 through 10), (Washington, DC: War Department, 19 August 1940); Department of the Army, *Field Manual 101-5 - Staff Officers' Field Manual: Staff Organization and Procedure* (with change 1), (Washington, DC: Department of the Army, 16 April 1951); Department of the Army, *Field Manual 101-5 - Staff Officers' Field Manual: Staff Organization and Procedure* (with change 1), (Washington, DC: Department of the Army, 29 April 1955); Department of the Army, *Field Manual 101-5 - Staff Officers' Field Manual: Staff Organization and Procedure* (with change 1), (Washington, DC: Department of the Army, 14 June 1968); Department of the Army, *Field Manual 101-5 - Staff Officers' Field Manual: Staff Organization and Procedure* (with change 1), (Washington, DC: Department of the Army, 19 July 1972); War Department, *Field Manual 21-40 - Defense Against Chemical Attack*, (Washington DC: War Department, 6 September 1946); Department of the Army, *Field Manual 21-40 - Defense Against Chemical, Biological and Radiological (CBR) Attack*, (Washington, DC: Department of the Army, 17 August 1954); Department of the Army, *Field Manual 21-40 - Chemical, Biological and Radiological (CBR) and Nuclear Defense* (with change 1), (Washington, DC: Department of the Army, April 1969); Department of the Army, *Field Manual 21-40 - NBC (Nuclear, Biological and Chemical) Defense* (with change 1), (Washington, DC: Department of the Army, 14 October 1977). With the exceptions discussed in the paragraphs surrounding this one, doctrine remained static during the period.

²⁷ Department of the Army, *Field Manual 3-9 - Staff Chemical Officer*, (Washington, DC: Department of the Army, 1955), 19-20.

²⁸ Ibid.

²⁹ 1955 version of FM 101-5, 25-26.

³⁰ 1968 version of FM 101-5, p. 4-14.

³¹ 1972 version of FM 101-5, pp. 4-16 - 4-17.

³² U.S. Army Chemical Corps Field Requirements Agency, *Final Report, CMLCD 58-7, Phase I, Part A, Requirements for Chemical Corps Staff Personnel at Division, Corps, and Field Army Levels and at Logistical and Missile Commands (U)*, (Fort McClellan, AL: U.S. Army Chemical Corps Field Requirements Agency, June 1960), A-11 through A-12.

³³ Ibid., A-3.

³⁴ 1993 version of FM 101-5 (Final Draft), p. 3-44.

³⁵ FM 3-101, p. 1-13.

³⁶ Ibid., p. 1-14.

³⁷ Department of the Army, *Field Manual 71-100-1 - Tactics, Techniques and Procedures for the Heavy Division (Coordinating Draft)*, May 1991, pp. 2-74 - 2-75. While not officially doctrine, this manual provides a typical MAIN CP configuration and matches word for word the doctrinal responsibilities of the division chemical staff contained in FM 3-101.

³⁸ Commandant, U.S. Army Chemical School, ATZN-CM-CO memorandum, Subject: Growth in the Chemical Corps, 4 Feb 87, p. 3, para 1.b. (2)(c).

³⁹ Department of the Army, *Table of Organization and Equipment Number 17-4H0 (change 20), HHC Armored Division*, (Washington, DC: Department of the Army, 20 Oct 79), p. II-03; *Table of Organization and Equipment Number 3-107H0, NBC Defense Company*, (Washington, DC: Department of the Army, 20 Jun 80), both confirm that the Division Chemical Section existed in the Division HQ TOE until the early 1980s.

⁴⁰ Department of the Army, *Field Manual 3-101: Chemical Staffs and Units*, (Washington, DC: Department of the Army, 19 November 1993).

⁴¹ FM 101-5 (1993 Final Draft), pp. 3-44 - 3-45.

⁴² FM 3-101, C-4.

⁴³ Ibid., p. 4-10.

⁴⁴ Department of the Army, *Field Manual 3-100: NBC Defense, Chemical Warfare, Smoke, and Flame Operations*, (Washington, DC: Department of the Army, 23 May 1991).

⁴⁵ FM 100-5, p. 6-10.

⁴⁶ Ibid.

⁴⁷ Ibid., p. 6-11.

⁴⁸ Ibid.

⁴⁹ Ibid., p. 2-6.

⁵⁰ FM 100-5, p. 2-13.

⁵¹ FM 3-100, p. 2-10.

⁵² Ibid., pp. 2-8 - 2-10.

⁵³ FM 100-5, p. 6-10.

⁵⁴ FM 3-100. p. 3-0.

⁵⁵ FM 3-100, pp. 3-0 - 3-2.

⁵⁶ FM 101-5, p. 2-9.

⁵⁷ Ibid., p. 3-37.

⁵⁸ Ibid., p. 2-28.

⁵⁹ The Air Defense Coordinator (ADACoord), Air Liaison Officer (ALO), Aviation Liaison Officer (AVLNO), Chemical Officer (ChemO), Engineer Officer (DivEng), Fire Support Coordinator (FSCoord), Provost Marshal (PM), and Signal Officer (SigO) all fall under the coordinating staff responsibility of the Division Operations Officer (G-3), implying that each has duties supporting those of the G-3. On the other hand, the Chaplain, the Surgeon, the Staff Weather Officer, and the Transportation Officer each fall under the coordinating staff responsibilities of other coordinating staffs (i.e. the G-1, the G-2 or the G-4), an indication that their duties lie principally in areas other than operations, plans and training. The Inspector General, Public Affairs Officer, and Staff Judge Advocate, while commonly described as special staff, by regulation serve as personal staff officers to the commander in divisions. Additionally, many of these same special staff officers, while technical advisors to the commander, do not oversee the employment of units within the division, a key similarity among the staff officers selected for analysis. Of the remaining staff officers (ADACoord, ALO, AVLNO, and FSCoord), only the ADACoord meets the other selection criteria. The AVLNO and FSCoord manage combat arms functions, making any comparison with these staff officers more a review of differences than similarities. The ALO, as a U.S. Air Force element attached to the staff, operates in unique ways and under unique circumstances. Additionally, the ALO has no subordinate units in the division to manage. Finally, this discussion eliminates the ADACoord primarily because of concerns about limitations of space in the monograph.

⁶⁰ Ibid., p. 3-49.

⁶¹ Ibid.

⁶² Department of the Army, *Department of the Army TOE Handbook 05330L-CTH: Commander's TOE Handbook, Engineer Brigade, Heavy Division*, (Washington, DC: Department of the Army, 26 March 1993), 37-38.

⁶³ Department of the Army, *Field Manual 5-71-100: Division Engineer Combat Operations*, (Washington, DC: Department of the Army, 22 April 1993), pp. 2-7 - 2-9.

⁶⁴ FM 101-5, p. 3-63.

⁶⁵ Department of the Army, *Department of the Army TOE Handbook 11065L-CTH: Commander's TOE Handbook, Division Signal Battalion (MSE)*, (Washington, DC: Department of the Army, 31 July 1990), 27 & 35.

⁶⁶ Department of the Army, *Field Manual 11-50: Combat Communications Within the Division (Heavy and Light)*, (Washington, DC: Department of the Army, 4 April 1991), pp. 2-8 - 2-17.

⁶⁷ Ibid., pp. 2-8 - 2-9.

⁶⁸ Department of the Army, *Field Manual 19-1: Military Police Support for the AirLand Battle*, (Washington, DC: Department of the Army, 23 May 1988), p. 5-2.

⁶⁹ FM 101-5, p. 3-59.

⁷⁰ Ibid. Interestingly, as with the ChemO, the term OPCON seems inappropriate. By definition in Appendix G, FM 101-5 (Final Draft), OPCON is a command relationship (implying a commander exercises this authority, not a staff officer). He directs forces assigned to accomplish specific and limited tasks or missions. This implies a limit to the duration of the relationship, where OPCON as applied to the PM and ChemO implies a more permanent relationship.

⁷¹ Department of the Army, *Department of the Army TOE Handbook 19333H-CTH: Commander's TOE Handbook, Military Police Company, Heavy Division*, (Washington, DC: Department of the Army, 15 January 1993), 12-13.

⁷² FM 19-1, pp. 5-3 - 5-4.

⁷³ For example, a review of TOE Handbooks 11065H-CTH and 05330L-CTH reveals that, while a signal staff officer supports the Engineer Brigade, no comparable staff support exists at echelons below that. The Signal Battalion has no organic engineer staff officer. One can argue that no requirement exists for an engineer staff officer in a signal battalion, but that discussion lies beyond this paper's scope.

⁷⁴ FM 101-5, pp. 3-44 & 3-46.

⁷⁵ FM 3-101, p. C-5.

⁷⁶ TRADOC Pam 525-5, p. 4-5.

⁷⁷ FM 3-101, pp. 1-13 - 1-14.

⁷⁸ Author's personal observation. Having served as a chemical staff officer in two heavy divisions (4th Infantry Division and 3rd Armored Division), my experience has been that the NBC information flow tends to remain in the chemical staff versus flowing throughout the coordinating staff. While these two divisions may not be an accurate representation of reality, discussions with other peer chemical officers suggests this observation is valid.

⁷⁹ As a possible solution, division staffs might organize along modular lines, with each module capable of functioning independently from the others, with equal functional capabilities and the ability to tailor the module to meet the mission and perceive operational environment.

⁸⁰ FM 3-101, p. C-4.

⁸¹ For example, according to CPT Flugel from the Directorate for Combat Developments, U.S. Army Chemical School, is currently developing a revised version of the Automated NBC Information System (ANBACIS) that integrates with the Phoenix Command and Control system. The DCD, USACMLS intends to test this new system during the Prairie Warrior '96 Advanced Warfighting Experiment. Additionally, the Ground Based Common Sensor, Unmanned Aerial Vehicles (UAVs), and All Source Analysis System (ASAS) provide appropriate examples of the kinds of technological enhancements available to speed information flow while reducing the number of soldiers required to operate the system.

⁸² FM 3-101, p. C-7.

⁸³ Author's personal observation. Having served nearly two years as a Brigade Chemical Officer, my ability to appreciate armored brigade tactics and operations provided greater insights of how NBC can effect tactical operations. Additionally, my skills provided the brigade with not simply a special staff officer, but an integrated (and integral) member of the brigade planning and operations staff.

⁸⁴ Appendix 1 to Annex A, CMLCD 58-7, Phase I, part A, *Final Report, Requirements for Chemical Corps Staff Personnel at Division, Corps, and Field Army Levels and at Logistical and Missile Commands*, June 1960.

⁸⁵ Appendix 2 to Annex A, CMLCD 58-7, Phase I, part A, *Final Report, Requirements for Chemical Corps Staff Personnel at Division, Corps, and Field Army Levels and at Logistical and Missile Commands*, June 1960

⁸⁶ FM 101-5 (Final Draft), pp. 3-44 - 3-46.

⁸⁷ FM 3-101, pp. 1-12 - 1-13.

⁸⁸ Chapter 3, FM 101-5 (Final Draft).

⁸⁹ Department of the Army, *Field Manual 19-1: Military Police Support for the AirLand Battle*, (Washington, DC: Department of the Army, 23 May 1988), p. 4-5.

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